

Indiana State Museum

Educational Opportunities for Your Students

Indiana's Ice Age Animals



Lesson Plan
Text, Resources and Activities
Grades 3-8

INFORMATION FOR EDUCATORS

Indiana's Ice Age Animals

Grades 3-8

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INTRODUCTION

The lessons contained in this packet are intended for classroom use by teachers of grades 3-8. The activities are designed to be innovative and to meet Indiana Academic Standards in Science. Please feel free to reproduce the text and worksheets.

SETTING THE STAGE

To begin the lesson plan, you might want the environment of your entire classroom to reflect the environment of the Ice Age time period. This can be achieved by incorporating the theme into bulletin boards, computer activities, showing a film, or simply decorating the classroom. When you set the tone of your classroom in this manner, learning becomes an all-encompassing experience for your students. Vocabulary words can become part of your weekly spelling list and stories of various Ice Age animals can become enrichment in your reading circles. We encourage you to use this lesson plan as a springboard to further knowledge about the Ice Age and the animals that lived during this time period. A pre-test is included for you to try and see what the students knowledge is about the Ice Age before beginning the lesson plan. A resource section also is included in the lesson plan that will give you a picture and general information on several animals that lived during the Ice Age.

Note to teacher: Throughout the text you will see names such as "Harlan's musk oxen." These names usually reflect the location where remains were found or someone who discovered them. Students should know the names in order to identify the animals, but it is not as important to find out the origin of the names.

P R E - T E S T A B O U T T H E I C E A G E

NAME: _____

CLASS: _____

**Which of the following animals was alive in Indiana during the Ice Age?
Circle your answer. *Hint: There is one Ice Age animal per line.***

1. giant beaver, seal, walrus
2. tiger, leopard, sabertooth
3. gazelle, giraffe, caribou
4. giant short-faced bear, panda bear, koala bear
5. elephant, mammoth, giant ice worm
6. aardvark, armadillo, hedgehog
7. jaguar, lion, panther
8. gorilla, polar bear, ground sloth
9. white-tailed deer, red-nosed reindeer, killdeer
10. polar frog, giant land tortoise, great hairy toad
11. human, dog, cat
12. piccadilly, peccary, large-snouted pig

**The following is a list of Ice Age animals that once lived in Indiana. Write an
“x,” “c,” or “m” next to each animal depending on whether that animal . . .**

<i>went extinct</i>	=	<i>X</i>
<i>changed into a smaller form</i>	=	<i>C</i>
<i>moved/migrated to a different area</i>	=	<i>M</i>

- | | |
|--------------------------|----------------------------------|
| _____ 13. mastodont | _____ 18. Pleistocene black bear |
| _____ 14. tundra musk-ox | _____ 19. stag moose |
| _____ 15. ancient bison | _____ 20. sabertooth |
| _____ 16. caribou | _____ 21. Pleistocene jaguar |
| _____ 17. giant beaver | _____ 22. mammoth |

Test Your Knowledge (Continued)

Which of the following statements is true about the Ice Age? Answer T or F.

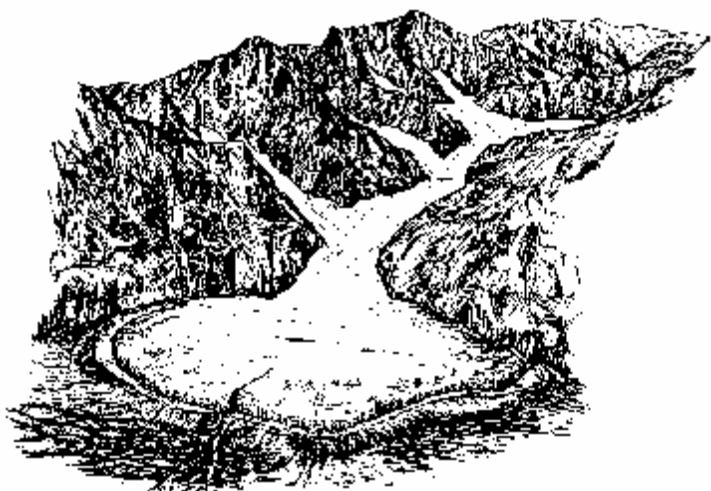
- _____ 23. Humans did not live during the Ice Age.
- _____ 24. The temperature was always below freezing during the Ice Age.
- _____ 25. Glaciers came from the north to cover Indiana.
- _____ 26. All of Indiana was once covered by glaciers.
- _____ 27. Glaciers move very slowly, the slowest moving only four feet per year!
- _____ 28. Many rocks, such as granite, which are not native to Indiana are found on the surface because the glaciers left them there.
- _____ 29. The Ice Age is a period of time within the past 2-3 million years when great masses of ice covered much of North America.
- _____ 30. The Pleistocene is the time period in which there were no glaciers.
- _____ 31. Interglacial periods were warmer times because glaciers had retreated.

Indiana's Ice Age Animals

The **Ice Age** is the period of time within the past 2-3 million years when great masses of ice called **glaciers** covered a large portion of the northern half of the earth. Geologists also refer to this time as the Pleistocene, a period of geologic time that began two million years ago and ended 10,000 years ago.

Glaciers can be thought of as giant rivers of ice. Indiana glaciers came from the north, moving very slowly. In one year, an ice sheet may only move four feet! As the glaciers moved through, they made permanent changes in Indiana's landscape.

Glaciers wiped out rivers, lakes and streams that had existed for millions of years while creating new rivers and streams that flowed in different directions than the ones before. Glaciers scraped across rocks, leaving large grooves and scratches. They carved new valleys. Sediment carried by the glaciers filled in existing valleys and created new hills.



These **interglacial** periods had warmer climates similar to Indiana's climate today, but with cooler summers and warmer winters.



The deposits of Ice Age glaciers are the main material making up the Indiana landscape today. Glaciers covered all but the southern fourth of Indiana during the most recent glaciation. The soil in northern and central Indiana is composed of glacial till deposited by the glaciers upon their retreat. In northern Indiana, glacial deposits can be hundreds of feet deep!

The glaciers came and went several times during the Ice Age. There were warmer, milder intervals lasting thousands of years that occurred in between glacial periods.

During interglacials, Indiana was covered by forests and prairies. Animals that today live in warm climates, such as jaguars and land tortoises, were typical interglacial species. Others, such as mastodons, mammoths, caribou, and musk oxen were more suited for periods when the ice was closer and the temperature colder. Geologists believe we are in one of these interglacial periods today. This means that the Ice Age is not yet over! Thousands of years from now, glaciers may once again begin making their way down from the north to cover Indiana.

We know which animals lived in Indiana during the Ice Age because their fossil remains have been found here. Often the remains are found in a cave. Sometimes they are found in swamps, bogs, riverbeds or out-washed gravel deposits. The remains of most Ice Age animals are scarce and have been limited to a few counties. Mastodont remains, however, have been found in nearly every county in Indiana.

Ice Age Animals

During the Ice Age, many large animals lived in the area that is now Indiana. Some of these giants have since become extinct, some have migrated away, and others have evolved in to smaller varieties. The largest of the animals, mastodons, Harlan's musk oxen, peccaries, armadillos, dire wolves, giant beavers, giant short-faced bears, mammoths, stag-moose, sabertooths, ground sloths, giant land tortoises and tapirs, all became extinct.

Jaguars, bison, and black bears that lived during the Ice Age were larger than the ones living today. These animals have changed into smaller varieties. Caribou, tundra musk oxen and jaguars disappeared in Indiana but spread to occupy other parts of the world and did not become extinct. White-tailed deer and elk were the only large mammals to survive in Indiana past the Ice Age. These animals were extirpated (became extinct from the area) by the late 1800s due to over-hunting and habitat destruction. Deer were reintroduced in the early 1900s and have been very successful since that time.



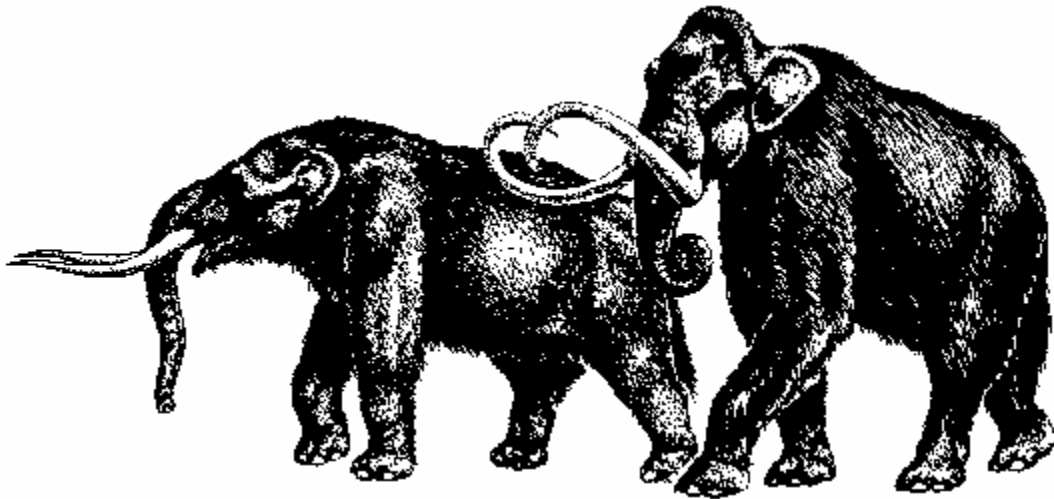
Although many species of Ice Age animals are now extinct, all have relatives living today. Harlan's musk oxen and giant beavers may be extinct, but there also were smaller related species of musk oxen and beavers that lived during the Ice Age that are still living today. The larger Harlan's musk oxen went extinct, while the smaller tundra musk oxen survived.

Both giant beavers and modern-sized beavers lived in Indiana during the Ice Age. While a modern beaver is approximately three or four feet long, the giant beaver was eight feet long and weighed as much as a black bear! Relatives of Ice Age peccaries and armadillos are living in the Southwest today. Sabertooths are distant relatives of lions and other large cats, and dire wolves were large ancestors of modern wolves. The giant short-faced bear is extinct, but there are many other species of bears living today. The stag-moose is thought to have possessed the body of a moose and the muzzle of an elk. It is the largest member of the deer family ever to exist. Its

antlers measured 42 feet across and weighed 30 pounds! The stag-moose itself stood six feet tall at the shoulder. Paleontologists do not know why the stag-moose had such enormous antlers. Although this animal is extinct, its relative, the moose, lives in northern areas of the country today.

Both mammoths and mastodons may look like hairy versions of elephants, but only mammoths belong to the elephant family, Elephantidae. Mastodons belong to the family, Mammutidae and have no direct ancestors living today. Although mammoths and mastodons **coexisted** during the Ice Age, mammoths are more closely related to elephants than they are to mastodons!

Mammoth teeth and elephant teeth are very similar, while mastodon teeth look quite different. Mastodon teeth have big bumps, or cusps, which were useful for crushing food. Mastodons lived in forests and swamps and feasted on stems, plants, bark and twigs. Mammoth teeth look a lot like tread on the bottom of a tennis shoe! Mammoth teeth rubbed together to tear food. Mammoths ate grasses and lived in open areas. A mastodon had six sets of molars on each side. As they wore down, they fell out and were replaced by teeth coming in from behind.



Aside from the difference in teeth, mastodons differed from mammoths by having lower foreheads, stockier bodies and a slightly smaller size. Mastodons stood about 10 feet at the shoulder, while mammoths stood at 11 feet. The first humans in North America were likely hunters of these large animals and may have been their only predators, aside from possibly sabertooth cats.

The End of the Ice Age

Around 11,000 years ago, a variety of animals became extinct across North America. Most of these animals were the large mammals. Before this extinction, the diversity of large mammals in North America was similar to that of modern Africa. As a result of the extinction, relatively few large mammals are now found in North America. Scientists believe that environmental shifts due to rapidly changing climate and perhaps human hunting may have caused the extinction of many of these Ice Age giants.

The first humans in the Americas came across the Bering Land Bridge at least 13,000 years ago. These people, called **PaleoIndians**, lived at the same time as the Ice Age animals. Because animal populations moved from place to place, PaleoIndians were nomadic, meaning they moved from place to place with the animals and never had permanent settlements.

These people hunted wild animals and gathered plants. The animals they hunted included many that went extinct, but also some that survived. Some scientists believe that human over-hunting of various Ice Age animals contributed to their extinction. It is likely that PaleoIndians hunted Ice Age animals such as mammoths, mastodons and ground sloths in Indiana, but proof of this (spear points found near large mammal remains) is lacking in this part of the country.



V O C A B U L A R Y

Ice Age: The period of time within the past 2-3 million years when great masses of ice covered a large portion of the northern half of the earth.

Glacier: A huge mass of ice which moves very slowly and covers large areas of land.

Interglacial: A period of time within an Ice Age when the glaciers have retreated.

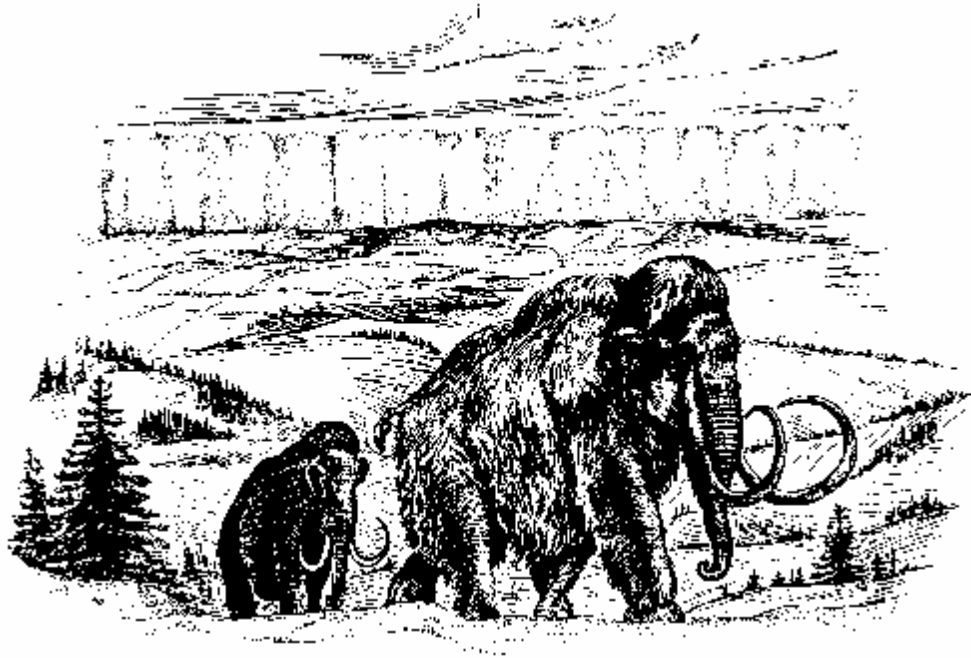
PaleoIndians: The first humans in the Americas.

Coexist: To live at the same time and in the same geographic area.

BACKGROUND TEXT FOR STUDENTS

GRADES 3 - 8

Indiana's Ice Age Animals



The **Ice Age** is the period of time when large pieces of ice called **glaciers** covered a large part of the northern half of the earth. This time also is called the Pleistocene period. The Pleistocene period began two million years ago and ended about 10,000 years ago.

Glaciers can be thought of as giant rivers of ice. In Indiana, glaciers came from the north and moved very slowly, about four feet a year. When these glaciers moved through Indiana, they changed the way the land was shaped.

Glaciers wiped out the rivers, lakes, and streams that were already there and created new ones. They also left behind, sediment and large rocks known as glacial till. These rocks and sediment left behind are the biggest factors in Indiana's landscape today.

During the Ice Age, the glaciers came and went several times. The times between the glacial movement were known as **interglacial** periods. These periods were similar to Indiana's climate today. They had cooler summers and warmer winters. Geologists believe we are in one of these periods today. This means in a thousand years, glaciers may cover Indiana again.

Ice Age Animals

During the Ice Age, many large animals lived in Indiana. We know this because scientists have found fossil remains of these animals. Some of these animals have become extinct, some have migrated away, and others have evolved into smaller animals that still live today. The largest animals that became extinct are mastodons, Harlan's musk oxen, peccaries, armadillos, dire wolves, giant beavers, giant short-faced bears, mammoths, stag-moose, sabertooths, ground sloths, giant land tortoises, and tapirs. Some animals that changed into smaller ones are jaguars, bison, and black bears. Caribu, tundra musk oxen and jaguars did not become extinct but migrated out of Indiana into other parts of the world.

Many of the Ice Age animals are extinct, but they all have relatives living today. The giant beaver was eight feet long and weighed as much as a black bear, but today the modern beaver is roughly three to four feet long. Relatives of Ice Age peccaries and armadillos are living in the Southwest today. Sabertooths are related to lions and other large cats, and dire wolves were large ancestors of modern wolves. The giant short-faced bear is extinct, but there are many other species of bears living today.

Both mammoths and mastodons may look like hairy versions of elephants, but only mammoths belong to the elephant family. This family is called Elephantidae. Mastodons belong to the family Mammutidae and have no direct living ancestors today. Although mammoths and mastodons **coexisted** during the Ice Age, mammoths are more similar to elephants than they are to mastodons!

Mammoth teeth and elephant teeth are very similar, but mastodont teeth look quite different. Mastodont teeth have big bumps that were used for crushing. Mastodons lived in forests and swamps and ate stems, plants, bark and twigs. Mammoth teeth look a lot like the bottom of a tennis shoe! Mammoth teeth rubbed together to tear food. Mammoths ate grasses and lived in open areas. Other differences between mammoths and mastodons are that mastodons have lower foreheads, stockier bodies, and are a little smaller.

The End of the Ice Age

About 11,000 years ago, many animals became extinct in North America. Most of these animals were the large mammals. Because of this extinction, there are only a few large animals found in North America today. Scientists believe that environmental change caused by a fast changing climate and human hunting may be the reason so many of these large animals became extinct. Humans arrived in North America about 13,000 years ago. These people are called **PaleoIndians**. They lived during the Ice Age. They survived by hunting wild animals and gathering plants. The PaleoIndians would follow herds of large animals from place to place. Many scientists believe that too much hunting might have caused several of the Ice Age animals to go extinct.

DISCUSSION

- Although there have been no volcanoes in Indiana lately, volcanic rocks such as granite can be easily found right on the surface of the ground! How did these rocks get here?

Glaciers deposited rocks in Indiana that were originally from other places. That is how volcanic rocks can appear on the surface in Indiana. The presence of igneous (volcanic) or metamorphic rocks on the surface indicates past glacial activity. The fact that these rocks are smooth and round supports the conclusion that they were brought by glaciers. The wearing and weathering occurred during the glaciation making these rocks smooth.

- Some relatives of Ice Age animals, such as tortoises, jaguars and armadillos, live in warm climates today. Others, like caribou, elk and tundra musk-oxen, live in cold climates today. What might this indicate about the climate during the Ice Age?

The climate during the Ice Age fluctuated. There were intermittent periods in which the climate was much more temperate. Warm-weather animals were probably here at that time. Animals that fared well in the cold, such as caribou, elk and musk-oxen, followed the glaciers as they retreated north but were present when glaciers covered Indiana. The climate during the Ice Age was colder than it is today, but it was much more equitable. The extremes were not as great, although the average yearly temperature was cooler. Some animals, such as armadillos or caribou, may have been seasonal migrants during the Ice Age.

- Mammoths are closely related to modern elephants. Two noticeable differences between mammoths and elephants are hairiness and ear size. Mammoths were hairier and had smaller ears. Based on what you know about Ice Age environments, and what you know about African environments, why might mammoths be hairier and have smaller ears?

Hairiness and ear size are both adaptations to the environment. Mammoths were hairy because it helped them keep warm in a very cold environment. Africa, on the other hand, is very hot, and therefore elephants there have very little hair. Large ears are useful to help cool the animal because of the large surface area. Heat is dissipated through large ears, and large ears also can work like fans for the elephant. Large ears on a mammoth, however, would be likely to get frostbite! Think about the parts of your body that get cold first when you go outside in the winter. Extremities such as fingers, toes, ears and noses are the first to get cold. Smaller ears, because they were closer to the head and had a smaller surface area, were much more beneficial to the Ice Age mammoths.

CLASSROOM ACTIVITIES

Grades 3-8

Subject: Science

Duration: One – Five Classes

Activity 1

Objectives

- ❑ Students will learn about the effects glaciers have on landscapes.

Indiana's Academic Standards

Science: 4.3.5, 6.7.2

Social Studies: 4.3.6

Supplies:

Sand

Aluminum Pan

Water

Dixie Cups

Pebbles

Instructions:

Study the effects of glaciers by creating your own glaciers and landscapes.

1. With damp sand or dirt, have students create a landscape in an aluminum pan.
2. Students will then take a large ice cube (ice frozen in a Dixie cup will work) and push it across the landscape.
3. Ask them to record what happens. How does the moving ice affect the landscape? What happens when the ice melts?
4. Make some ice cubes with sand and pebbles frozen into them, just as a glacier would contain these things. What does this create when it melts?

Activity 2

Objectives

- ❑ Students will learn about the different sizes and heights of Ice Age animals; and
- ❑ Students will be able to compare them to modern animals.

Indiana's Academic Standards

Science: 3.4.5, 4.6.4

Mathematics: 3.5.7, 4.5.1, 6.5.1

Supplies:

Handout: *Big Animals that Roamed the State*

Paper (regular)

Paper (extra long; 10-11 feet)

Measuring Tape

Scale

Instructions:

Just how large were Ice Age animals? Students can perform these measuring activities that will help them understand the size and weight of Ice Age animals compared to related animals today.

1. Have students create a table that lists the following animals in the first column: bison, musk-ox, beaver, horse, tapir, armadillo, peccary, black bear and jaguar. The second column should be labeled "Ice Age Size." The third column should be labeled "Modern Size." The fourth column should be labeled, "Difference." Students will create this table based on the average heights of Ice Age animals listed in the handout.
2. Without showing students the Ice Age animal height handout "Big Animals That Roamed the State," ask them to predict the heights (from largest to smallest) of the following six animals: mammoth, mastodont, stag-moose, ground sloth, giant short-faced bear and sabertooth. With a measuring tape, measure out the height of these animals and mark each on a large piece of white paper (the paper needs to be 10 or 11 feet long). Hang this paper on the wall in your classroom or in the hallway.
3. The antlers of a stag-moose weighed 30 pounds! What else weighs 30 pounds? Decide on four or five objects (maybe objects around the classroom) that can be weighed on a scale. Ask the students to predict which of the objects weighs the closest to 30 pounds. Can the students lift that object? (You may want to just ask them this rather than have them try it.)

Activity 3**Objectives**

- ❑ Students will learn basic facts about Ice Age animals; and
- ❑ Students will learn what the environment was like during the Ice Age

Indiana's Academic Standards

Science: 3.2.7, 4.2.7, 5.2.7, 6.2.8, 8.2.7

Social Studies: 3.5.5

Supplies:

N/A

Instructions:

Take a field trip to your local State Museum or Science museum to learn more about Ice Age animals and other prehistoric life in Indiana. Locate other museums near your community that may have Ice Age exhibits.

Activity 4

Objectives

- ❑ Students will learn about the Ice Age environment; and
- ❑ Students will learn how the different people and animals survived during the Ice Age.

Indiana's Academic Standards

Science: 3.1.5, 6.4.9

Social Studies: 3.3.5

Supplies:

Paper

Pencils

Markers or Crayons

Instructions:

Make a diorama of a scene from the Ice Age. Choose either a time of glacial activity or an interglacial period to recreate. Include animals that would have inhabited Indiana at that time. You may want to create PaleoIndians stalking a mammoth, dire wolves encircling a herd of musk-oxen, a sabertooth cat caring for her cubs or a family of peccaries hiding in a cave. Think about the type of vegetation that would have been around at that time. Have the students write a brief report and present the information and diorama to the class.

Activity 5

Objectives

- ❑ Students will learn about PaleoIndians and how they arrived in North America.

Indiana's Academic Standards

Social Studies: 4.3.9, 4.5.1, 5.1.1

English/ Lang. Arts: 3.5.2, 3.6.2, 4.5.3, 4.6.2, 5.5.3, 5.6.6, 6.5.3, 6.6.1, 7.5.3, 7.6.8, 8.5.3, 8.6.5

Supplies:

Paper

Pencils

Pens

Markers or Crayons

Instructions:

Think about PaleoIndians and their nomadic ways of Life. PaleoIndians came to the Americas from Asia across the Bering Land Bridge at least 13,000 years ago. They did not know they were exploring two new continents for the first time; they were merely following herds of animals.

1. Describe what life would have been like for a nomadic PaleoIndian.
2. Write a story about a family of PaleoIndians who had been traveling through freezing conditions during the Ice Age.
3. Draw a map to show the history of their journey.

Activity 6

Objectives

- ❑ Students will be able to improve their writing skills; and
- ❑ Students will be able to compare Ice Age animals with modern ones, and how each might survive.

Indiana's Academic Standards

Science: 3.1.1, 6.1.1

English/Lang. Arts: 3.5.1, 3.6.2, 4.6.2, 5.5.1, 5.6.3, 6.5.1, 6.6.1, 7.6.6, 8.6.5

Supplies:

Paper

Pencils

Instructions:

Rewrite a familiar animal fairy tale or fable, substituting related Ice Age animals for the animals in the story. For example, one can rewrite the story of “The Three Little Pigs” as “The Three Little Peccaries,” substituting a dire wolf for the Big Bad Wolf. Bricks and straw may not have been appropriate building materials during the Ice Age, but grass, moss and lichen, and ice would have.

Activity 7

Objectives

- ❑ Students will learn about glacial movement in Indiana.

Indiana's Academic Standards

Science: 5.6.2, 6.7.2, 8.2.1

Social Studies: 4.3.6

Supplies:

“Wisconsin and Illinoian Glacial Boundaries in Indiana” Worksheet

Blank County Map of Indiana

Pens, Pencils, Crayons, or Markers

Instructions:

The handout, “Wisconsin and Illinoian Glacial Boundaries in Indiana” shows the boundaries to which glaciers traveled at two different times during the Ice Age. The Wisconsin glacial boundary demonstrates the extent glaciers traveled into Indiana during the last glaciation, while the Illinoian glacial boundary represents the extent glaciers traveled into Indiana during the previous glaciation. List the names of the counties that the Wisconsin and Illinoian boundaries cross. In which county do you live? On the blank county map of Indiana, draw both glacial boundaries. Shade in the county in which you live. Using a state map as a reference, include the following in your map:

1. The state capital, Indianapolis
2. South Bend, Fort Wayne, Lafayette, Evansville, Bloomington, Terre Haute
3. The Wabash and Ohio Rivers
4. Hoosier National Forest

Activity 8

Objectives

- ❑ Students will be able to improve their research and report skills; and
- ❑ Students will learn all the basic facts about the animal they choose.

Indiana's Academic Standards

Science: 3.4.1, 3.4.5, 3.6.5, 4.6.4

English/Lang. Arts: 4.5.3, 5.5.3

Supplies:

Ice Age Animals Fact Sheets

Paper

Pencils or Pens

Instructions:

Choose one animal from the Ice Age animal fact sheets on which to write a report. Include the following information about the animal: scientific name, common name, physical description (what it looks like), height, closest relative, probable diet (was it a plant eater or a meat eater?), counties in which it has been found, extinction status (did it become extinct, change into a smaller variety, or migrate?), and one to two sentences explaining why the animal is interesting to you.

Activity 9

Objectives

- ❑ Students will learn how a guidebook works and is created; and
- ❑ Students will learn basic facts about various Ice Age animals.

Indiana's Academic Standards

English/Lang. Arts: 3.5.2, 3.6.2, 4.5.3, 4.6.2, 5.6.6, 6.6.1, 7.6.5, 8.6.1

Supplies:

Ice Age Animals Fact Sheets

Paper

Pencils

Crayons or Markers

Instructions:

Create an Ice Age animal guidebook using the Ice Age animal fact sheets as a reference. Choose four to six animals to include in the guidebook. Color a picture of each animal, then write a short paragraph about the animal. Be sure to include the animal's name, a physical description, size, the closest living relative, where in Indiana the animal is found, and any special or interesting facts about the animal.

Activity 10

Objectives

- ❑ Students will be able to imagine the Ice Age environment based on the senses; and
- ❑ Students will learn about how a PaleoIndian would have hunted.

Indiana's Academic Standards

Science: 6.4.9

Social Studies: 5.1.1

English/Lang. Arts: 3.5.2, 3.6.2, 4.5.3, 4.6.2, 5.5.3, 5.6.6, 6.5.3, 6.6.1, 7.5.3, 7.6.8, 8.6.1

Supplies:

Paper

Pencils or Pens

Instructions:

Imagine you are a PaleoIndian living in Indiana toward the end of the last Ice Age 11,000 years ago. How would you go about hunting a mammoth? What would it be like? Write a story incorporating the five senses: touch, smell, sight, sound, and taste. Describe what the mammoth feels like. What kind of noises does it make? How does mammoth meat smell and taste? Describe what the scene looks like.

Evaluation

A point scale can evaluate a student's work during lessons. Teachers also can custom-design an evaluation that could include observation, a numeric rating scale and/or class discussion.

Student Evaluation

Tell the students the word *evaluate* means to weigh, to judge, or to determine the value of something. The most important evaluator is the student himself or herself. Give each student a copy of the "I LEARNED..." Questions with each activity. Instruct them to turn in their answers to the questions with the assignment. Together as a class, go over their questions and answers, discussing how the answers to these questions could help the students to judge the quality of their own work, and improve it.



G L A C I E R M A T H

NAME: _____ CLASS: _____

A glacier moves very slowly, sometimes only about four feet per year. Knowing this, answer the following questions:

- _____ 1. How many feet would a glacier move in a month?
- _____ 2. How many inches would a glacier move in a month?
- _____ 3. How many inches would a glacier move in a day?
- _____ 4. There are 5,280 feet in one mile. If a glacier moves four feet per year, how many years would it take for the glacier to move one mile?
- _____ 5. A glacier moves 4 feet per year. How many yards is this per year?
- _____ 6. If a football field is 100 yards long, how many years would it take for a glacier to move across a football field?

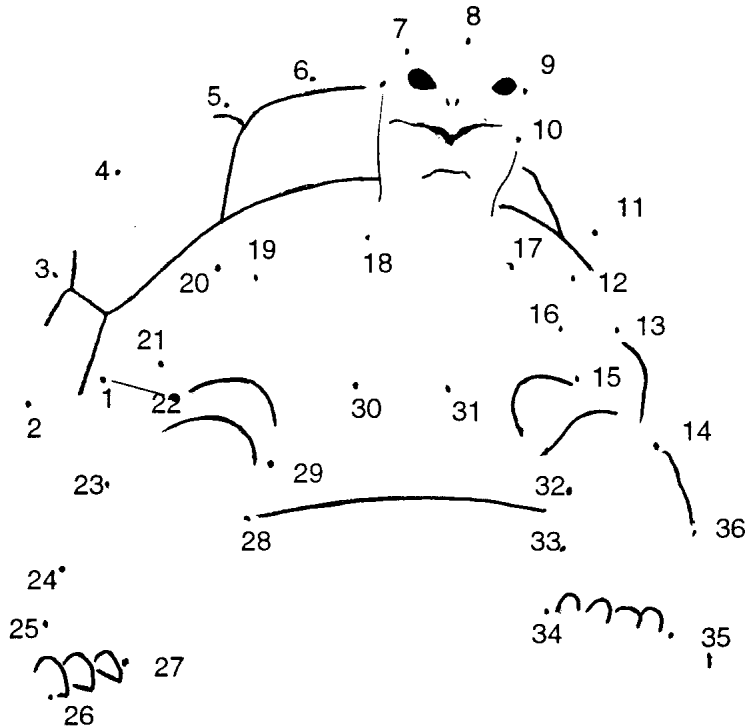
Bonus:

- _____ 7. Suppose the nearest glacier to Indiana today is 2,000 miles away. If another Ice Age is in fact coming, how many years would it take for the glacier to get to Indiana traveling four feet per year?
- _____ 8. What does this tell you about the *average* speed of a glacier?
- _____ 9. If this glacier, which is 2,000 miles away, could realistically get to Indiana in 5,000 years rather than the answer you got, how many feet would it be traveling in a year?
- _____ 10. Approximately how many feet is this?

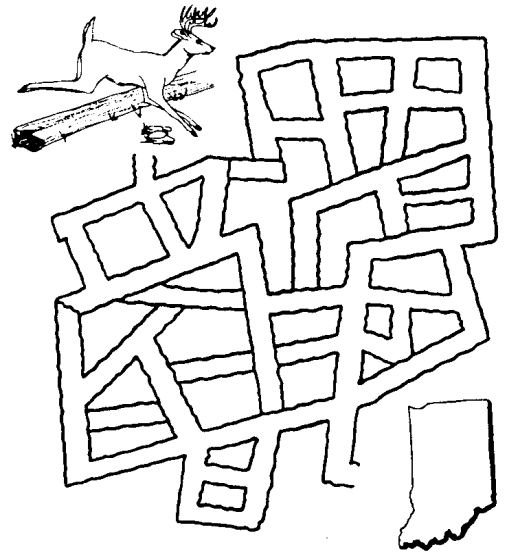


ICE AGE PUZZLES

NAME: _____ CLASS: _____



MAZE (below): Some of these beasts did not die, they just roamed. Please help the white tailed deer find his way home.



CONNECT THE DOTS (above):

Since I'm not a mammal, I haven't got fuzz.
Connect all the dots to find out who I was.

WORD SEARCH (right): Can you find the names of the creatures below? Search down each column and over each row.

bear	beaver	horse
jaguar	mammoth	musk ox
peccary	sloth	tapir

F	S	J	M	U	S	K	O	X	M
L	L	J	A	G	U	A	R	Y	A
O	O	H	E	U	E	E	R	C	M
W	T	S	R	L	O	A	U	R	M
B	H	R	K	R	C	G	A	S	O
R	E	R	H	C	X	E	U	C	T
R	H	A	E	O	B	E	H	R	H
A	V	P	V	O	R	I	P	A	T
O	R	E	A	E	P	S	A	M	X
C	E	K	R	S	R	A	E	T	O

WORD SCRAMBLE: Unscramble the words in the puzzle below, then answer the question. A fact you should know!

abciour _____
gostase-mo _____
ceyarc _____

oramadli _____
abclk rbae _____
mmahot _____

When did these animals roam Indiana? _____



ICE AGE PUZZLES

WORDS USED:

armadillo	dire wolf
sabertooth	beaver
horse	sloth
bison	Ice Age
stag-moose	caribou
mastodontt	tapir
deer	peccary
tortoise	

ACROSS:

3. This "beautiful" creature is twice the size of the modern species.

5. It had the head of an elk, the body of a moose and antlers that spanned 4 ½ feet across.

8. This animal that became extinct during the Ice Age was reintroduced to the Americas by European explorers who liked to ride them.

9. This is the only large mammal from the Ice Age that is living wild in Indiana today.

11. The ancient form of this giant animal went extinct, and the smaller, modern form nearly did, too, due to over-hunting.

12. It had a small trunk for a nose and now lives in South America.

14. Both males and females of this animal have antlers.

15. This animal is a hairy relative of a pig.

16. This giant, slow-moving animal has relatives living in South America.

DOWN:

1. This is the largest reptile of Indiana's Ice Age.

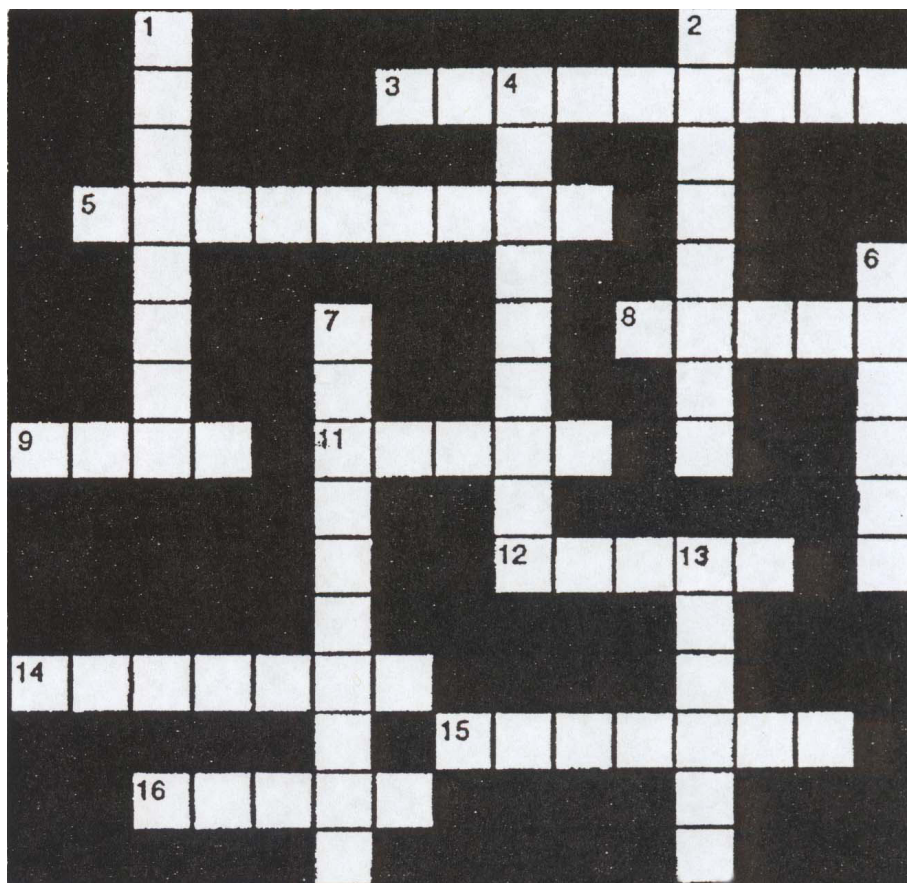
2. This animal may have looked like a dog, but its teeth and jaws were strong enough to crush bones.

4. It's the most common fossil animal found in Indiana and by far one of the largest fossil animals ever found.

6. Its extinct version was more than eight-feet long and probably ate water plants.

7. This animal had giant, knife-like canine teeth used for slashing the bellies of its prey.

13. A time of giant mammals.





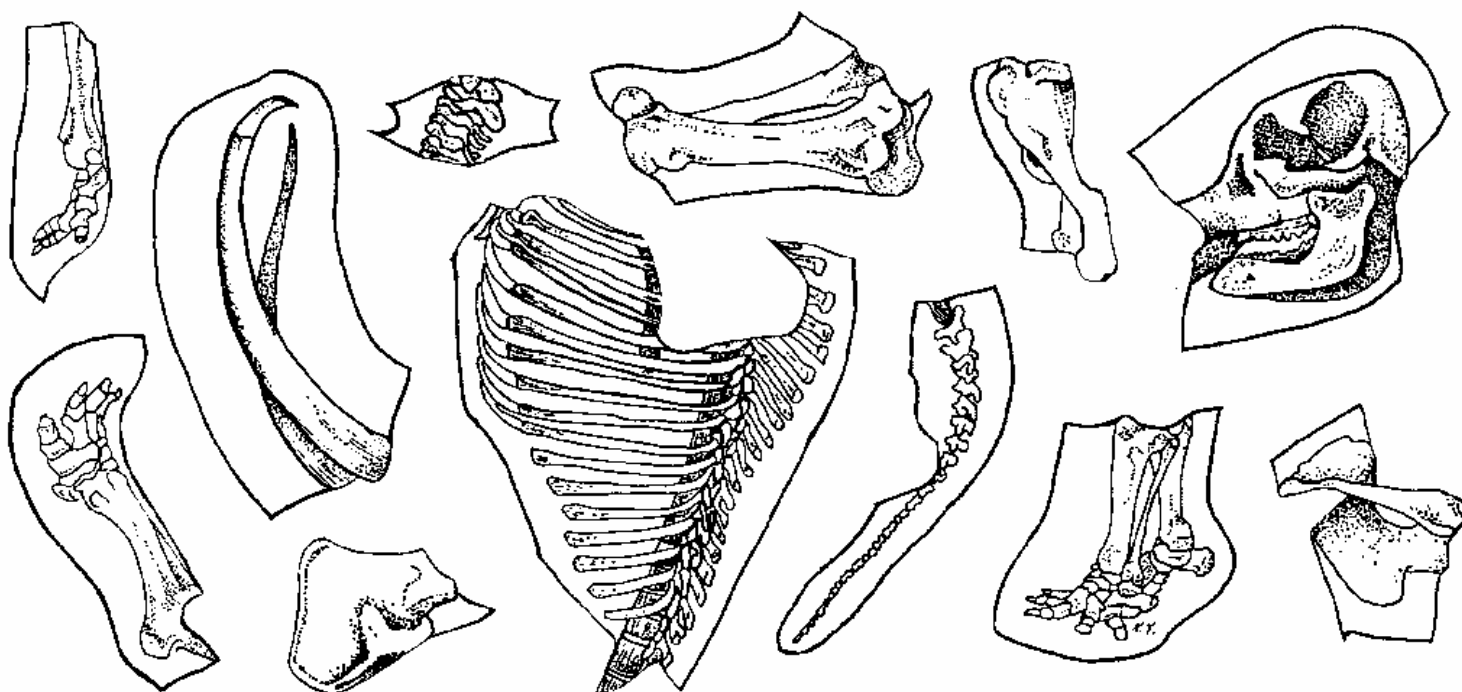
MASTODONT PUZZLE

Did You Know... that a fossil animal's skeleton is rarely found intact? ***Why?*** After an animal has died, time and nature can change the skeleton's appearance. Bones may be scattered by other animals, flowing water or changes in the physical landscape. Bones may be crushed or broken by other animals or forces of nature. A paleontologist works to reconstruct a fossil animal's skeleton once it has been found.

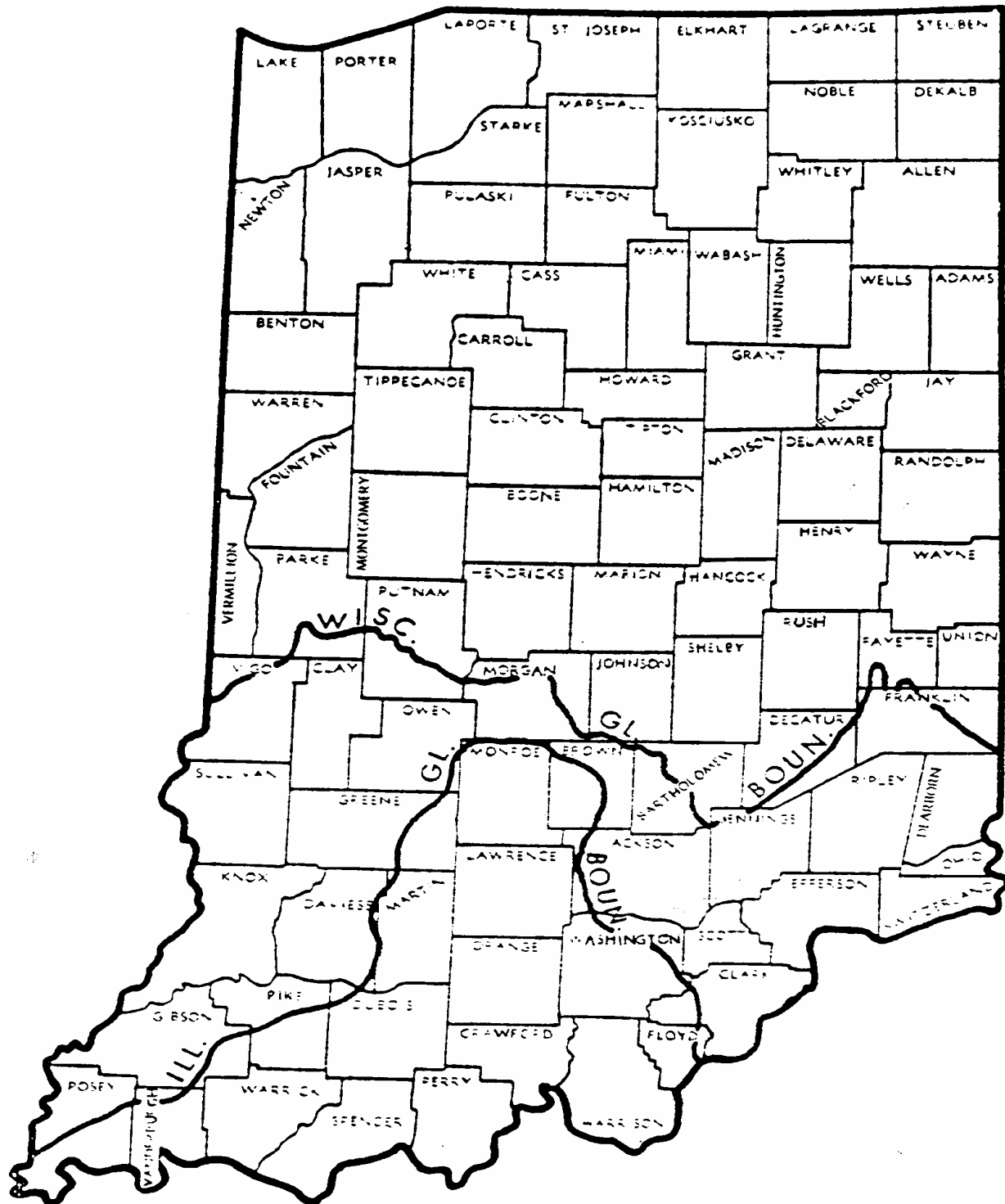
Can You Be a Paleontologist?

Cut out the mastodont bone puzzle pieces on this page and paste them back together on a piece of blank paper to make a complete skeleton. When you have finished, label the following bones, which are common to all mammals:

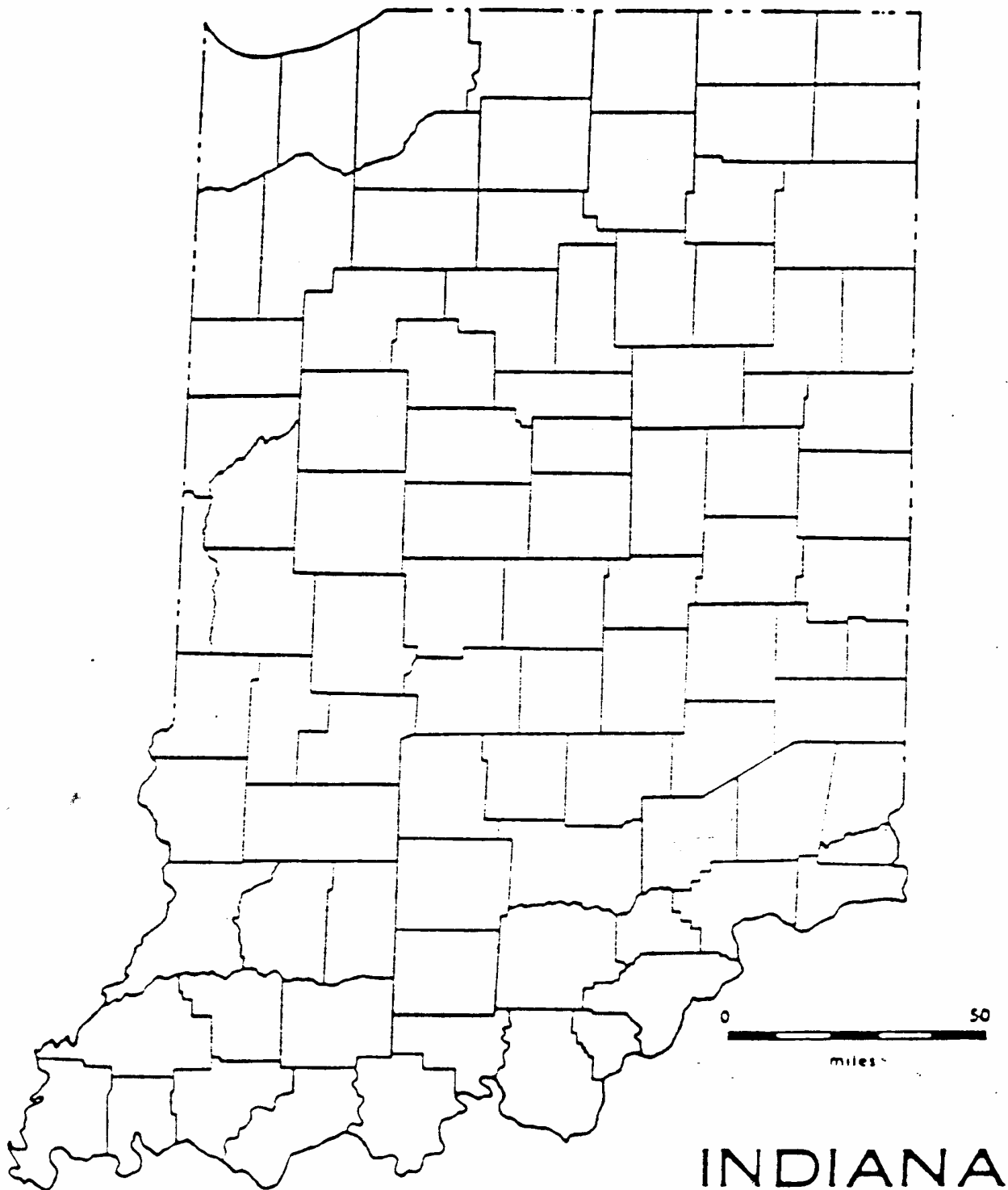
- skull
- vertebrae (backbone)
- ribs
- scapula (shoulder)
- humerus (front leg bone between the shoulder and the elbow)
- pelvis (hip bones)
- femur (back leg bone between the hips and the knee).



WISCONSIN & ILLINOIAN GLACIAL BOUNDARIES



CREATE YOUR OWN MAP



ACTIVITY WORKSHEET

ANSWERS

PRE TEST ANSWERS

- | | | |
|---------------------------|-------|-------|
| 1. giant beaver | 13. X | 23. F |
| 2. sabertooth | 14. M | 24. F |
| 3. caribou | 15. C | 25. T |
| 4. giant short-faced bear | 16. M | 26. F |
| 5. mammoth | 17. X | 27. T |
| 6. armadillo | 18. C | 28. T |
| 7. jaguar | 19. X | 29. T |
| 8. ground sloth | 20. X | 30. F |
| 9. white-tailed deer | 21. C | 31. T |
| 10. giant land tortoise | 22. X | |
| 11. human | | |
| 12. peccary | | |

GLACIER MATH ANSWERS

1. $\frac{1}{3}$ foot
2. 4 inches
3. $\frac{2}{15}$ inch (0.13 inches) or about $\frac{1}{8}$ inch
4. 1,320 years
5. $1\frac{1}{3}$ yards (1.33 yards)
6. 75 years

Bonus:

2,640,000 years

The average speed of a glacier must be faster than this.

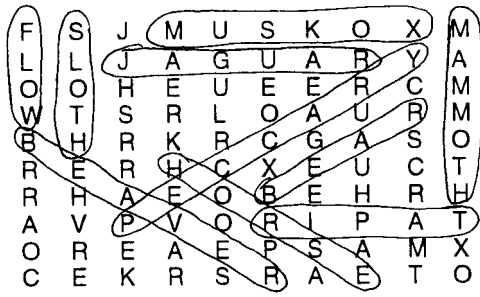
2,112 feet/year

Approximately 6 feet/day

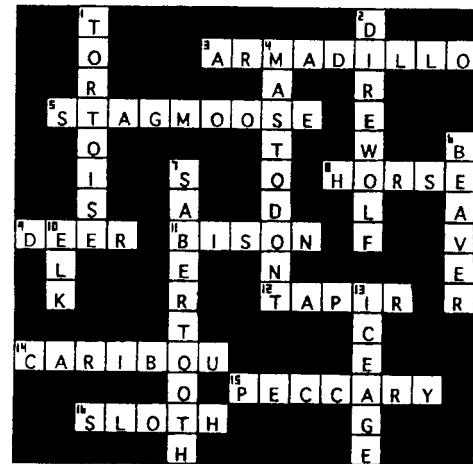
ACTIVITY WORKSHEET

ANSWERS

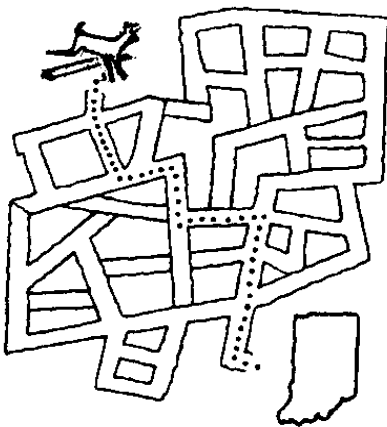
Word Search



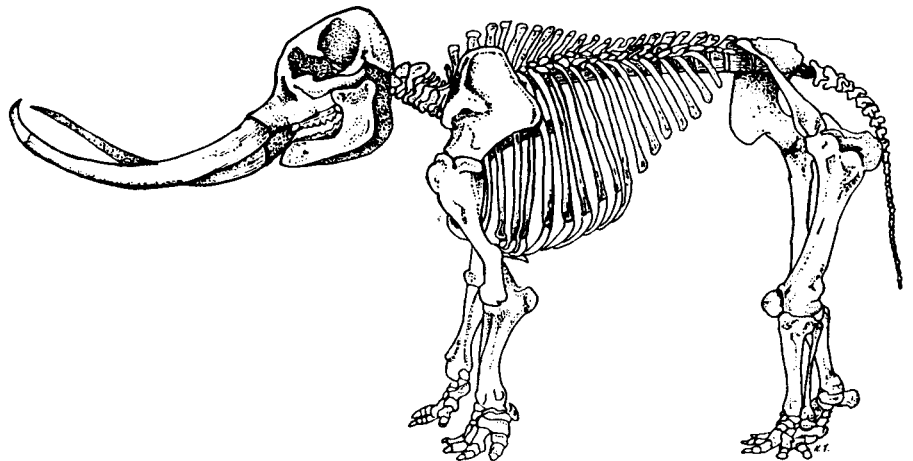
Crossword



Maze



Mastodont Puzzle



Word Scramble

caribou armadillo
stag-moose black bear
peccary mammoth

When did these animals roam Indiana? I C E A G E



B E A U T I F U L A R M A D I L L O

Dasypus bellus

How is the beautiful armadillo different from other armadillos?

The extinct beautiful armadillo was similar to the modern armadillo but twice its size, with a total length of more than four feet!

What is the nearest relative of the beautiful armadillo?

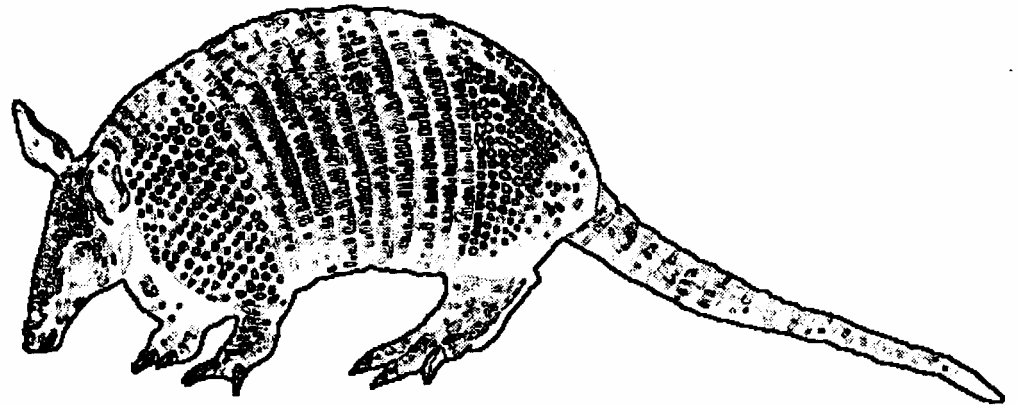
The nine-banded armadillo is the closest living relative. Modern armadillos can be found in the southern United States, Mexico, Central America and South America.

Where have armadillo remains been found in Indiana?

Isolated bony plates of the beautiful armadillo's outer shell have been found as fossil remains in four Indiana counties.

Did you know?

Modern armadillos can outrun a human and are excellent swimmers. They can hold their breath for six to 10 minutes. A modern armadillo can live to be 15 years old.





G I A N T L A N D T O R T O I S E

Geochelone

How do we know the giant land tortoise lived in Indiana?

A shell fragment of the extinct giant land tortoise was found in Crawford County cave sediments. This fossil may be anywhere from 75,000 to 125,000 years old! This is the only Ice Age tortoise find in Indiana. The majority of giant land tortoise remains have been found in Florida and Texas.

Why is this an important discovery?

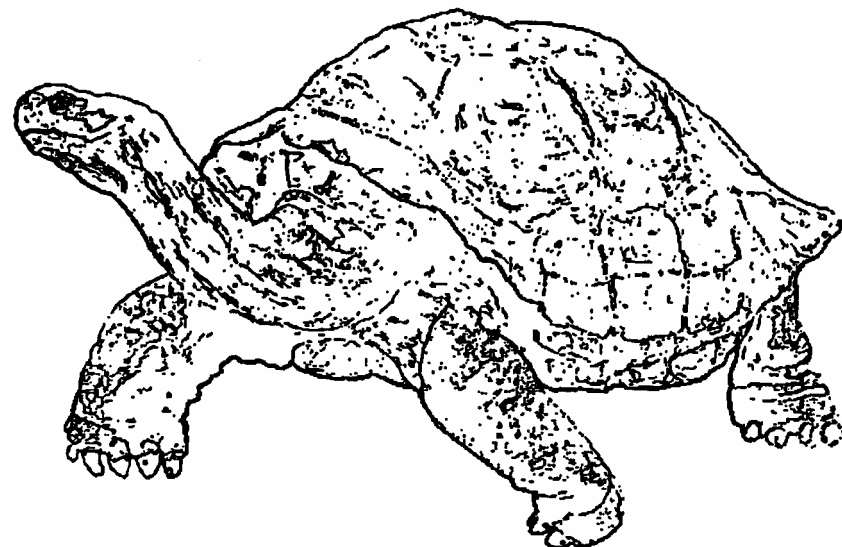
This tortoise is thought to be an excellent indicator of warm climates, since modern tortoises cannot live in cold environments.

What did the giant land tortoise look like?

The giant land tortoise had a shell more than four-feet long and had many of the same features as modern tortoises, such as thick, heavy legs for walking on land. They also may have eaten some of the same foods—such as flowers, grass, fruits and vegetables. Tortoises today have a toothless, horny beak, similar to birds, which is a perfect tool for tearing and crushing plant foods.

Did you know?

The word “turtle” describes all shelled reptiles. A tortoise is a turtle that lives on land. The shape of the shell tells if a turtle lives on land or water. A high-domed shell means a land turtle, while freshwater and sea turtles have flat, streamlined shells.





C**A****R****I****B****O****U**

Rangifer tarandus

Did the caribou once live in Indiana?

Caribou remains have been found in three Indiana counties. Finding bones of the caribou in Indiana is a good indicator of colder climates during the last glaciation.

Where are caribou seen today?

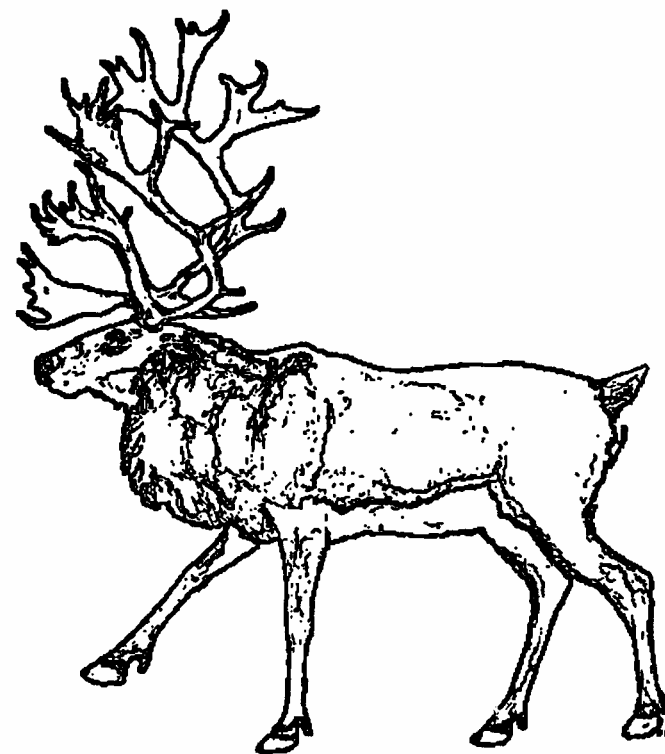
The caribou now lives in the forests and lowlands of northern Canada and Alaska and is well adapted to life in the far north. It has a thick, woolly undercoat protected by stiff outer guard hairs.

What do the hooves of the caribou indicate?

Caribou have broad, flat, deeply cleft hooves adapted for travel across soggy ground and snow. They travel in large herds and frequently migrate long distances. The caribou feeds on grasses, plants, mushrooms and low shrubs.

Did you know?

The caribou is the only member of the deer family in which both males and females have antlers.



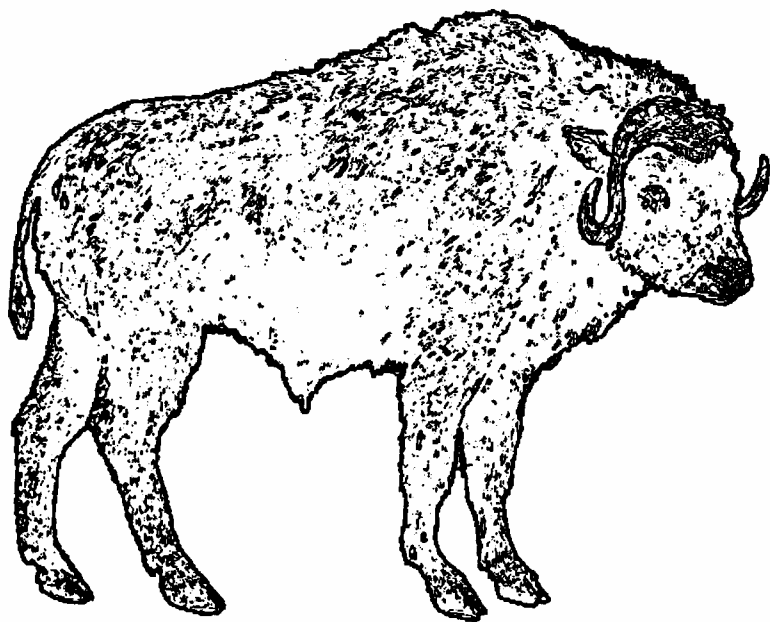


H A R L A N ' S M U S K - O X

Bootherium bombifrons

In what kind of environment did Harlan's musk-ox live?

Harlan's musk-ox inhabited open forests and parklands throughout much of North America until its extinction 10,000 years ago.



Are there many fossil specimens of Harlan's musk-ox in Indiana?

With more than 19 localities, the fossils of this musk-ox are particularly rich in Indiana.

What is the difference between Harlan's musk-ox and the tundra musk-ox?

Harlan's musk-ox was a much larger, more massive animal. It stood about six feet tall at the shoulder.

Did you know?

Although male and female skulls are quite different, both have down-turned horns.



T U N D R A M U S K - O X

Ovibos moschatos

Are there many fossil specimens of tundra musk-ox in Indiana?

The tundra musk-ox has survived from the Ice Age into modern times. Ice Age remains are relatively scarce in Indiana. A skull portion from Wayne County is the only Indiana find.



What is the significance of this find?

This find suggests that the natural living conditions for the tundra musk-ox, which include glacial ice margins, were once found as far south as Illinois, Indiana and Ohio.

What does the musk-ox look like?

The animal is compactly built with short legs, neck and tail, a slight hump over the shoulders, and downward sweeping horns. The living tundra musk-ox has coarse, brown hair that reaches nearly to the ground. Its undercoat is so dense that cold and moisture cannot penetrate it, making the musk-ox well adapted to arctic conditions.

Did you know?

When modern tundra musk-ox herds are attacked, the herd takes up a defensive, circular formation with the calves protected in the center. Scientists believe that this protective behavior took place during the Ice Age as well.



M**A****S****T****O****D****O****N****T**

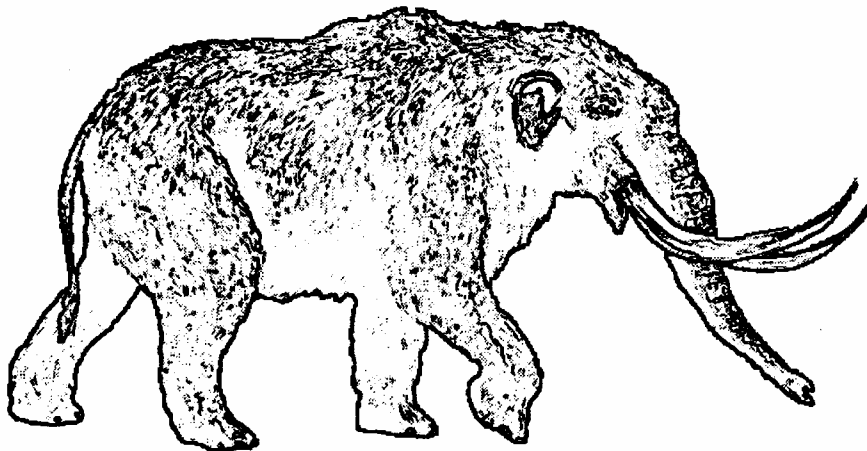
Mammut americanum

Were there many mastodonts in Indiana?

Mastodont remains have been found in more than 250 sites in Indiana. In fact, mastodont fossils are the most commonly found of all the Ice Age “giants.” Many of the more complete skeletons are recovered from ancient lake and bog deposits in northern and central Indiana.

Is the mastodont an elephant?

The mastodont is not an elephant and has no living descendants. The mastodont belongs to the family *Mammutidae*, while elephants and mammoths belong to the family *Elephantidae*. The mastodont has stockier bones than mammoths or elephants. Mastodont teeth were different as well. Their teeth have a series of broad cone-shaped knobs used for chopping and crushing bark, twigs and leaves. Mammoth and elephant teeth are much flatter, with small parallel ridges running across the tooth.



What did a mastodont look like?

The mastodont could reach up to 10 feet in height at the shoulder. The mastodont had a trunk and curved tusks, but its tusks usually curved less than those of the mammoth. It had a lower forehead and a thicker, stockier body than the mammoth. Mastodonts probably used their tusks to pry off and break branches, which they could then eat.

Did you know?

When both tusks of a single mastodont are preserved, one is usually shorter than the other. This indicates that one tusk was used exclusively and that the animals were either right- or left-tusked.



G I A N T B E A V E R

Castoroides ohioensis

How common was the giant beaver in Indiana?

Fossils of the giant beaver can be found in 21 Indiana counties as well as other Midwestern states. The giant beaver was the largest rodent of the North American Ice Age.

What did the giant beaver look like?

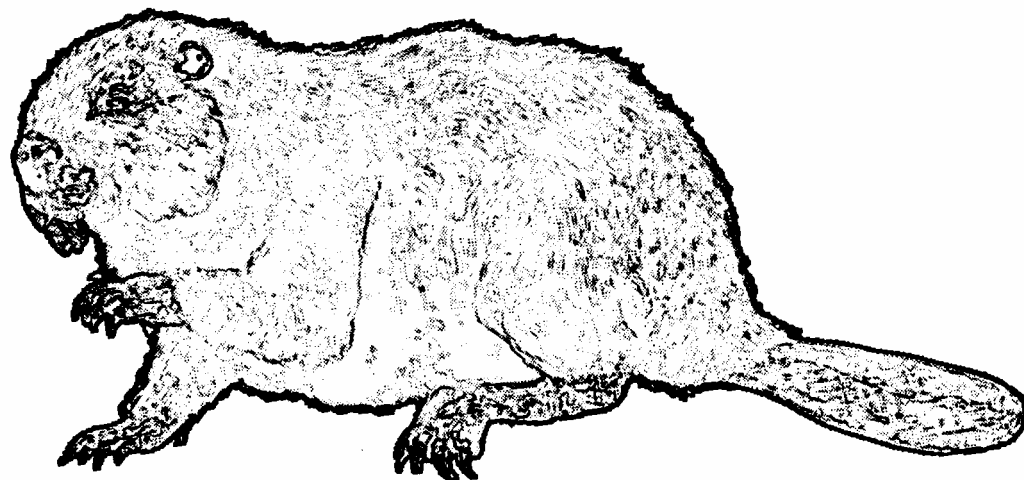
The giant beaver was more than eight-feet long, including its tail. This is twice the size of the modern beaver. It was as heavy as a black bear, weighing about 500 pounds.

What type of habitat did the giant beaver have?

It lived in lakes and ponds bordered by marshes. Some scientists believe it fed on water plants, rather than on tree bark. Modern beavers, on the other hand, use their sharp teeth to cut down trees and feed on the bark. The tips of the giant beaver's teeth were not flat and straight across, as in the modern beaver, so it is likely that it did not cut down trees or build dams. Because its legs were rather small for its body and because of its size, the giant beaver probably couldn't move well on land. It spent most of its time in the water. Giant beavers and modern beavers were both present during the Ice Age, but only the modern beaver survived.

Did you know?

Because it was an excellent swimmer and was so large, the giant beaver had few natural predators while in the water.





S A B E R T O O H

Smilodon fatalis

How common was the sabertooth in Indiana?

Only a few tooth and bone fragments indicate the presence of this giant cat in Indiana. Remains have been found in only Monroe County. They date from at least 100,000 years ago.

How big was the sabertooth?

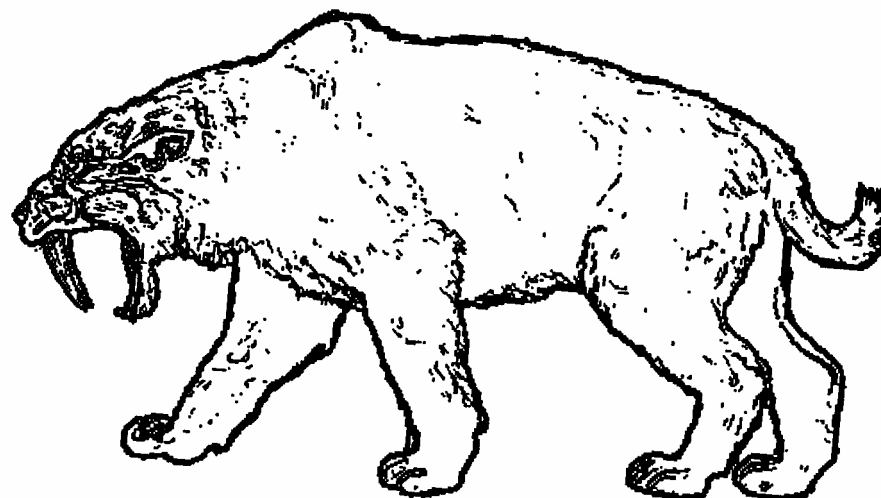
The sabertooth cat was the size of the modern African lion, but its front legs were larger and more powerful. Its back legs were used more for springing than running. It could probably run at a speed of 25 to 30 miles per hour in short bursts. It weighed as much as 600 pounds.

How did the sabertooth kill its prey?

The sabertooth was a specialized predator of Indiana's Ice Age. The knifelike shape of its upper canine teeth once led many scientists to believe they were used to stab or slash large prey. Each tooth margin is serrate, allowing it to cut like a steak knife. Most recent studies suggest that teeth were used to rip open the neck or soft underbelly of prey, allowing the prey to weaken through the loss of blood.

Did you know?

The sabertooth could kill animals much larger than itself. Many could pull down sick or young mastodons or mammoths. Studies reveal the sabertooth was a social animal, living and hunting in packs to provide food for young, sick or old members.





D I R E W O L F

Canis dirus

How common was the dire wolf in Indiana?

Dire wolf remains have been found in four Indiana locations. The best find was a well-preserved skull found in 25,000-year-old sediments in a Crawford County cave.

Was the dire wolf like any wolves today?

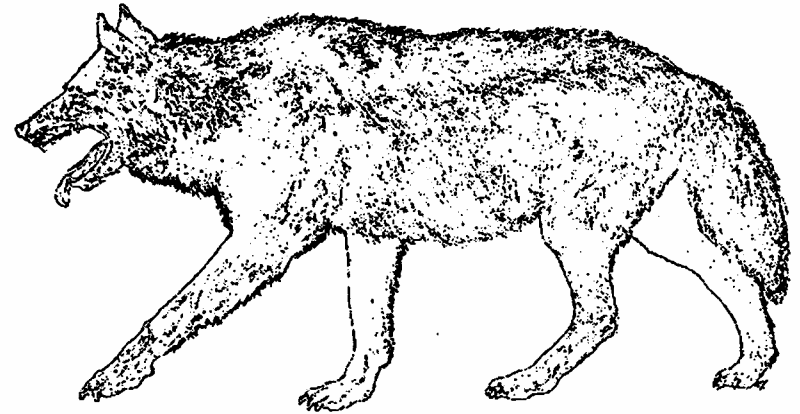
The dire wolf was similar in size to a large modern timber wolf. However, the dire wolf had a more massive head, with strong jaws and large teeth. It was easily capable of crushing bones.

How did the dire wolf hunt?

The dire wolf did not hunt alone. It hunted in a wolf pack and fed on trapped, injured or elderly animals such as peccaries, deer and musk-oxen.

Did you know?

The dire wolf is a member of the dog family, one of the oldest groups of flesh-eating mammals. Most canines are adapted for running swiftly after their prey.





J**A****G****U****A****R**

Felis onca augusta

Is this Ice Age jaguar similar to those that live in Central and South America today?

Two fossil sites show that these brightly colored Central and South American cats once inhabited Indiana. The jaguar from the Ice Age was 15% to 20% larger than today's jaguar.

Why are there no jaguars in Indiana today?

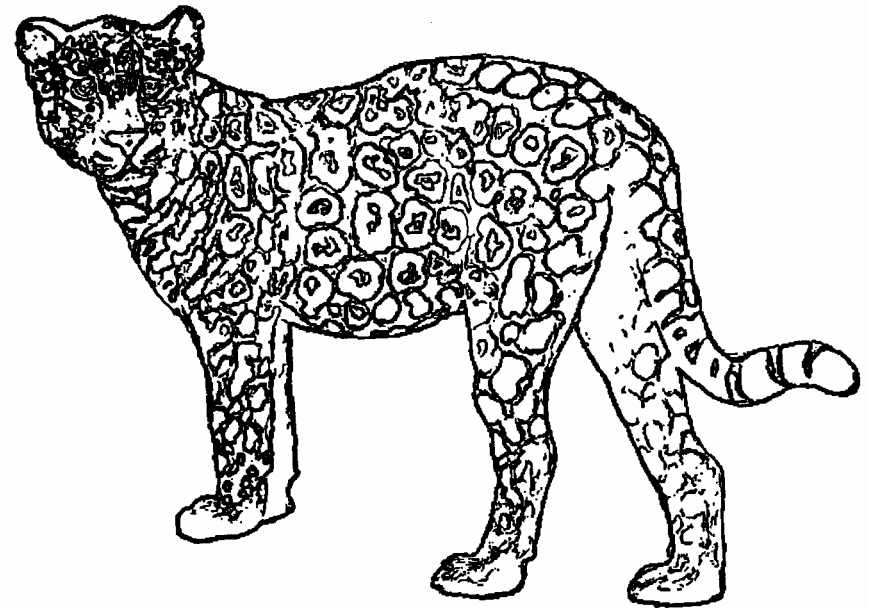
The jaguar migrated south, probably in response to environmental changes at the end of the Ice Age.

Does the jaguar have any enemies?

The jaguar is a solitary animal, meaning it spends most of life alone. In captivity, jaguars have been known to attack each other, but humans are probably the jaguar's only real enemy.

Did you know?

All cats, including the jaguar, walk on their toes. The heels of their feet are off the ground. They have sharp claws which can be retracted. Soft pads, claw retraction, and walking on toes allow cats to walk quietly so they can stalk and leap on prey from only a short distance.





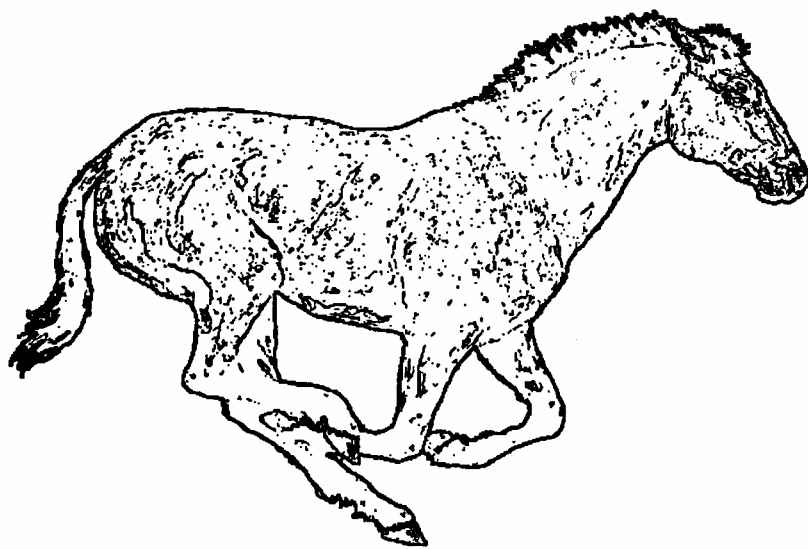
H**O****R****S****E**

*Equus***Were there many horses in Indiana during the Ice Age?**

Ice Age horses were very scarce in Indiana, although remains have been found in a few counties.

Why weren't there many horses in Indiana during the Ice Age?

The open plains environment that allowed horses to graze may not have been widespread in Indiana during the Ice Age, or at least did not provide conditions suitable for preservation of fossil bones and teeth.

**How have horses changed over time?**

Millions of years ago, the first known ancestors of today's horses stood only about 12-inches tall and hardly looked like a horse. The small mammal had four toes on its front feet and three on its back feet. During the next several million years, descendants became bigger and more horse-like to adjust to a changing world where tropical forests became mountains and grassy plains.

Did you know?

Horses became extinct in the Americas and were only reintroduced in historic times by European explorers.



L O N G - S N O U T E D P E C C A R Y

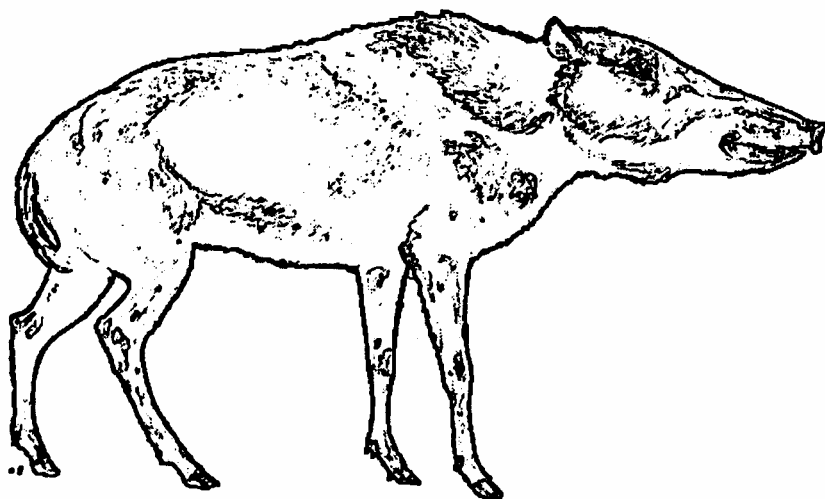
Mylohyus nasutus

What is a peccary?

A peccary is a pig-like hoofed mammal, but is only a distant relative of the pig. There are several different species of peccaries, three of which lived in Indiana—the long-snouted peccary, the flat-headed peccary and Leidy's peccary.

What were the Indiana peccaries like?

The largest of the peccaries, Leidy's peccary, stood three-feet high at the shoulder. Peccaries are equipped with razor-sharp canine teeth used for aggressive defense. The long-snouted peccary was very long-legged. It was nearly the size of a small deer.



Have many peccary localities been found in Indiana?

Peccary remains have been found in 13 Indiana locations. The largest collection of peccary remains comes from Megenity cave in Dubois County.

Did you know?

One of the first Ice Age fossil animals to be discovered in North America was the flat-headed peccary. Studies of the modern collared peccary provides clues to the life and habits of extinct peccaries. The modern peccary lives in small herds, uproots and eats farm crops, digs up acorns, and searches for frogs, lizards and snakes.

**T****A****P****I****R**

Tapirus

Are fossil tapir remains common in Indiana?

Fossils of the tapir are very scarce in Indiana. One of the two finds was a tooth in a Crawford County cave.

What is a tapir?

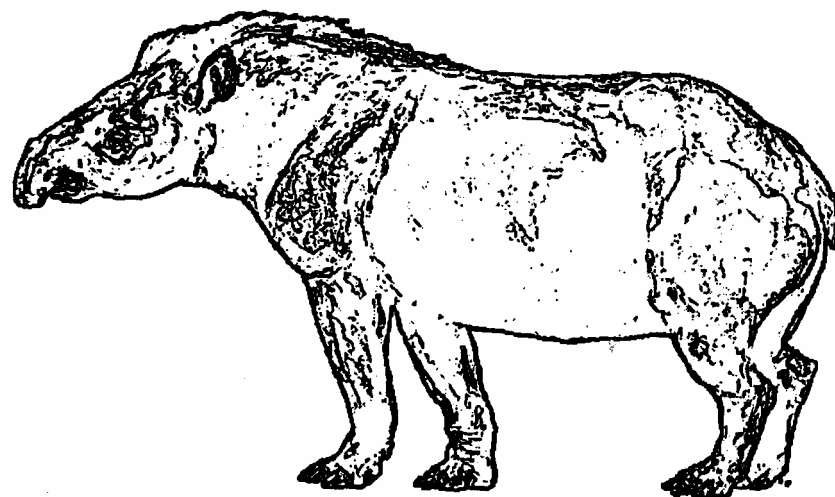
A tapir is actually a distant relative of the horse, adapted for living in dense vegetation surrounding swamps or in relatively thick forest. Tapirs browse on leaves and other soft plant foods, using a short trunk to push food into their mouths. Tapirs are found today only in South America and Malay.

Why were tapirs scarce during the Ice Age?

Today tapirs inhabit river and lowland areas in tropical and subtropical jungles. This environment may not have been widespread in Indiana during the Ice Age, or at least did not provide conditions suitable for preservation of fossil bones and teeth.

Did you know?

The broad-bellied Malayan tapir crosses rivers without swimming. It simply scrambles down the river bank to the bottom, then walks along underwater until it reaches the other side. South American Indians make shields from the South American tapir's tough hide and love to eat tasty tapir steaks.





S T A G - M O O S E

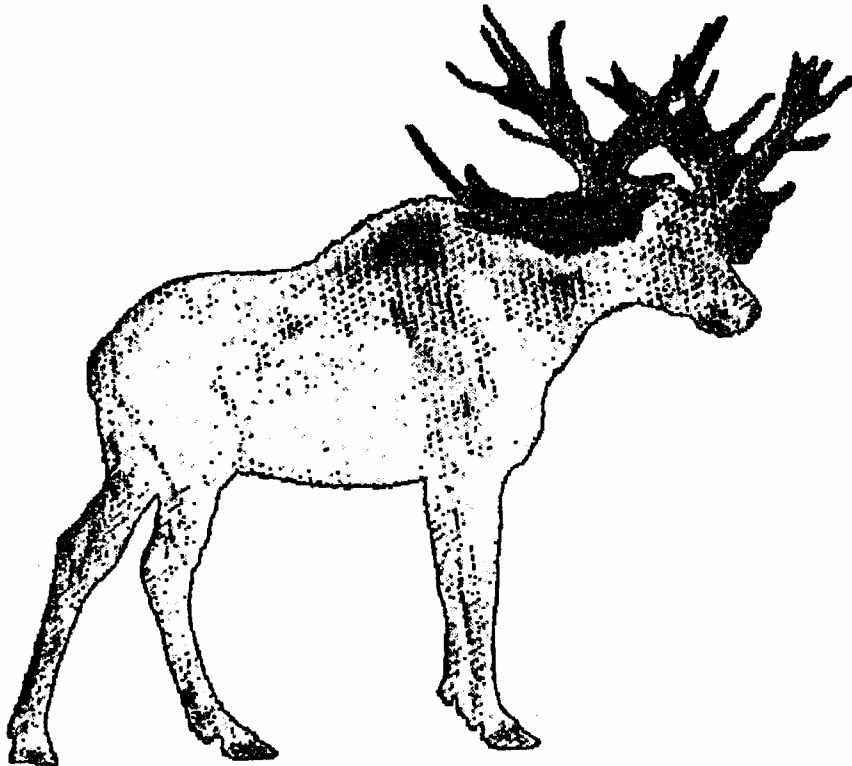
Cervalces scotti

What is known about the stag-moose in Indiana?

Skull and antler fossils have been found in 11 different Indiana sites.

What does the stag-moose look like?

The stag-moose is thought to have possessed a moose's body and the muzzle of an elk.



How large was the stag-moose?

The stag-moose stood nearly six-feet tall at the shoulder. Its rack of antlers spanned four and a half feet and weighed 30 pounds. The stag-moose was the largest member of the deer family ever to exist.

Did you know?

A stag-moose has antlers, which are not the same as horns. Antlers are made of bone and are shed yearly. Horns are made of keratin, the same substance that makes up hair and fingernails, and stay in place as long as the animal lives.



J E F F E R S O N ' S G R O U N D S L O T H

Megalonyx jeffersonii

In how many places have sloth remains been found in Indiana?

Remains of Jefferson's ground sloth are relatively scarce in Indiana, found only in three localities.

What did the ground sloth eat?

Ground sloths stood on their back legs and used their huge hook-like claws to pull down branches. With their lips and long tongue, they pulled leaves, twigs and nuts into their mouths, much the way a giraffe does. The sloth is thought to have lived mainly in woodlands and forests.



Did the ground sloth have any enemies?

About the size of an ox, the ground sloth was a big, heavy, slow-moving animal. The sabertooth may have attempted to prey on it, but the sloth's long curved claws could be deadly weapons of defense.

Did you know?

Today's three-toed sloth is the smaller relative of the giant ground sloth. It will grow to be only two feet long, while the ground sloth was about 11-feet long! Modern sloths spend their entire lives in trees, usually hanging upside down. They eat at night and sleep almost 20 hours a day.



A N C I E N T B I S O N

Bison bison antiquus

What type of bison lived in Indiana during the Ice Age?

The ancient bison lived during the Ice Age. The modern bison evolved from the ancient bison at the end of the Ice Age.

How have bison changed since the Ice Age?

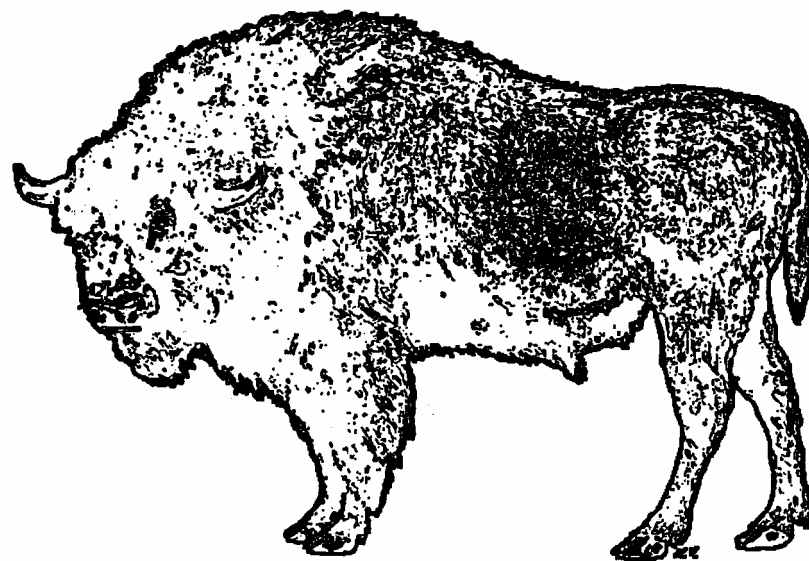
The ancient bison was slightly larger than the modern bison. The horn-core size of the ancient bison was larger as well.

Are ancient bison remains common in Indiana?

Only two ancient bison specimens have been found in Indiana.

Did you know?

Bison belong to the cattle family. Bison were invaluable to America's frontier pioneers. Commercial hunting, however, brought bison to the brink of extinction. Although they are still present in small numbers in the plains states, bison were gone from Indiana by 1830.





P L E I S T O C E N E B L A C K B E A R

Ursus americanus

Are Ice Age black bear remains common in Indiana?

Ice Age black bear remains have been found only in Harrison and Crawford counties.

How is the Ice Age black bear different from modern black bears?

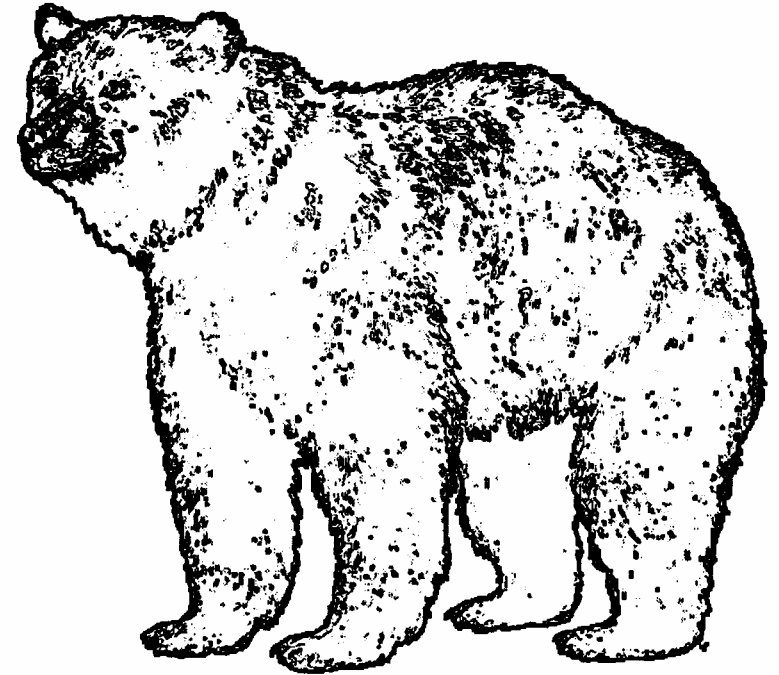
A larger form of the black bear lived in Indiana during the Ice Age. This larger form is considered to be an extinct subspecies.

Are black bears still living in Indiana?

The black bear is still found in the East and Midwest today, although it hasn't been seen in Indiana since 1888. Bears were hunted to extinction by early Indiana settlers.

Did you know?

Black bears in Indiana often denned in caves. This is where the majority of black bear remains have been found.





G I A N T S H O R T - F A C E B E A R

Arctodus simus

Have many remains of the giant short-faced bear been found in Indiana?

A nearly complete skeleton of a giant short-faced bear was found in Fulton County, Indiana. This is one of the best examples of a short-faced bear ever found. However, this is the only evidence of short-faced bears in Indiana.

What did the giant short-faced bear look like?

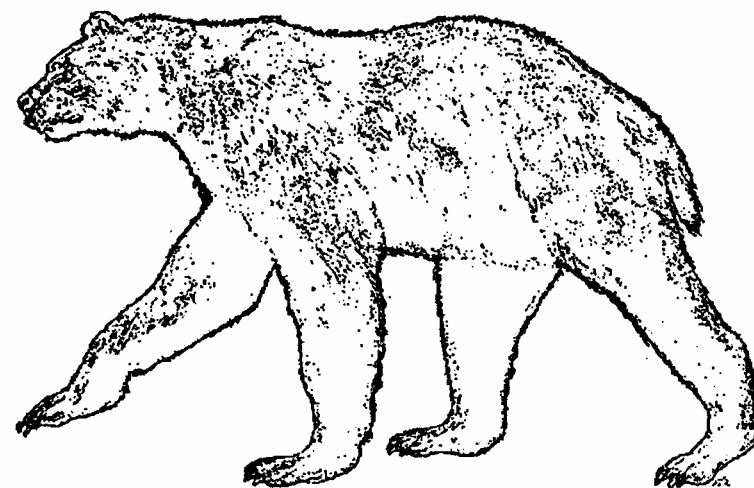
The giant short-faced bear was the largest, most powerful predator of the North American Ice Age. It stood more than five feet at the shoulder when standing on all fours. Its short, broad muzzle gave it a very cat-like appearance and suggests a predatory lifestyle.

How is the short-faced bear different from other bears?

The long legs and short body suggest high-speed running, which is unusual for a bear. It ate more meat than bears do today and must have been a vicious predator.

Did you know?

It is possible that competition from invading grizzly bears may have prompted the extinction of this species.





J E F F E R S O N ' S M A M M O T H

Mammuthus columbi jeffersonii

Where in Indiana have remains of mammoths been found?

Mammoth remains have been found in more than 80 known locations throughout Indiana. Although a complete mammoth skeleton was found in an ancient lake deposit in Grant County in 1903, most of Indiana's mammoth remains occur as isolated bones or teeth. There were several species of mammoths, and some, but not all, lived in frozen environments. Jefferson's mammoth, named after President Thomas Jefferson, is the only mammoth species that has been found in Indiana and was an inhabitant of warmer environments than those of the frozen arctic.

Are mammoths more closely related to mastodons or elephants?

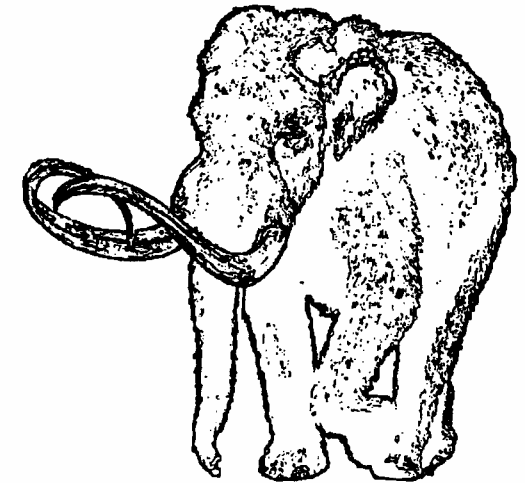
Mammoths are more closely related to modern elephants than they are to mastodons. Mammoths and mastodons lived during the same time period, but occupied different environments. Mammoths grazed in open grasslands similar to elephants today, while mastodons occupied forests and swamps.

What was the lifestyle of a mammoth?

Mammoths were the giant land mammals of their time and could grow to be 11-feet tall at the shoulder. Mammoths roamed in herds and ate mostly grasses, which they grinded to a pulp. Mammoths had few predators because of their large size, although the young may have been attacked by sabertooths. There is evidence humans hunted mammoths toward the end of the Ice Age and may have even contributed to their extinction. Evidence for mammoth hunts in Indiana have not yet been discovered.

Did you know?

A pair of mammoth skeletons were discovered in Nebraska facing each other with their tusks tightly interlocked. It is believed these two young mammoths charged each other, locking their tusks together. The mammoths may have then fallen and could not get up because of the tangled tusks.



BIG ANIMALS THAT ROAMED THE STATE

Dire wolf—30-38 inches at shoulder, or 2 ½ to 3 feet; size of a large timber wolf.

Sabertooth—71 to 94 inches, or 5 ¾ to 7 ¾ feet, head and body length (excludes tail); size of a lion.

Pleistocene jaguar—68 to 85 inches, or 5 ¾ to 7 feet, head and body length (excludes tail); 15% to 20% larger than modern form.

Pleistocene black bear—36 to 42 inches, or about 3 ⅛ feet, shoulder height; modern form goes to 36 inches.

Short-faced bear—62 inches, or 5 ⅛ feet, shoulder height.

American mastodont—106 to 118 inches, or 8 ⅞ to 9 ⅞ feet, shoulder height.

Jefferson's mammoth—126 to 134 inches, or 10 ½ to 11 ⅛ feet, should height.

Flat-headed peccary—30 inches, or 2 ½ feet, shoulder height.

Leidy's peccary—35 inches, or 2 ¾ feet, should height.

Jefferson's ground sloth—138 inches, or 11 ½ feet, total length; top of rump height 59 inches, or about 5 feet.

Beautiful armadillo—47 inches, or 3 ¾ feet, total length; about two times the size of a modern armadillo.

Pleistocene tapir—About 43 inches, or 3 ½ feet, shoulder height.

Pleistocene horse—About 45 inches, or 3 ¾ feet, shoulder height.

Giant land tortoise—48 inches, or 4 feet, shell length.

Giant beaver—98 inches long, or 8 ⅛ feet.

Harlan's musk ox—74 inches, or 6 ⅛ feet, at withers (tallest point between the shoulders).

Tundra musk ox—52 to 54 inches, or 4 ½ feet, at withers.

Ancient bison—About 75 inches, or 6 ½ feet, at withers.

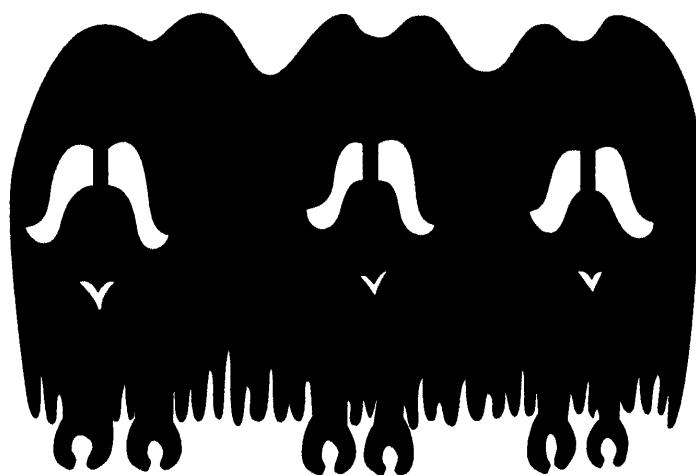
Modern bison—60 to 72 inches, or 5 to 6 feet, at withers.

Stag-moose—71 inches, or 5 ¾ feet, at withers.

Elk—48 to 60 inches, or 4 to 5 feet, at shoulders.

Caribou—42 to 48 inches, or 3 ½ to 4 feet at shoulders.

Deer—Up to 48 inches, or 4 feet, at shoulders.



“I LEARNED...” QUESTIONS

Name _____ Date _____

- 1. What were you expected to do for this assignment?**
- 2. In this assignment, what did you do well?**
- 3. If you had to do this assignment over, what would you do differently?**
- 4. What help do you need from me?**

Indiana | State Museum

LESSON PLAN EVALUATION

Your feedback is important to us. We welcome your comments to help us plan lessons in the future. Please check your responses and return to the Indiana State Museum. You may return the evaluation by mail, fax, or e-mail to:

Attention: Teacher and Student Program Coordinator, ssteinem@dnr.state.in.us

1. Please indicate the lesson plan you received:

- ☐ James Whitcomb Riley
- ☐ Madam C. J. Walker
- ☐ Young Abraham Lincoln
- ☐ The Anti-Slavery Movement
- ☐ Modes of Transportation
- ☐ Quilts
- ☐ Civil War Booklet
- ☐ Amish of Indiana
- ☐ Oliver P. Morton
- ☐ Indiana's Ice Age Animals

1. Did you find the lesson plan easy to understand and use?

Yes ____ No ____ Not sure ____

If "no," what was the problem? _____

2. Were the connections to the state standards appropriate?

Yes ____ No ____ Not sure ____

Comments: _____

3. Was the length of this lesson plan

too short? ____ too long? ____ just right? ____

Comments: _____

4. Was the lesson plan appropriate for the grade/ability level of your students?

Yes ____ No ____ Not sure ____

Comments: _____

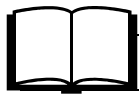
5. What activity did your students like the best? _____

6. What activity did your student like the least? _____

Why? _____

How could we improve it? _____

Additional comments: _____



RESOURCES

Books

Anderson, Elane and Kurten, Bjorn, *Pleistocene Mammals of North America*.

Bahn, P.G. and Vertut, J., *Images of the Ice Age*.

Bahn, Paul and Lister, Adrian, *Mammoths*.

Heuvelmans, B., *On the Track of Unknown Animals*.

Sutcliffe, A.J., *On the Track of Ice Age Animals*.

Web Sites

The World Wide Web is full of information on the Ice Age and Ice Age animals. A keyword search will yield hundreds of potential sites. Most of these sites will offer general information on the Ice Age and the animals that lived during this time period. The following are sites that offer more depth and general information on the Ice Age.

www.enchantedlearning.com

www.mnh.si.edu

www.bigchalk.com

www.museum.state.il.us/exhibits/larson/mammut.html